PhytoKeys 181: 105–111 (2021)
doi: 10.3897/phytokeys.181.71522
https://phytokeys.pensoft.net

RESEARCH ARTICLE

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Vaccinium motuoense (Ericaceae), a new species from Xizang, China

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Academic editor: Yasen Mutafchiev | Received 13 July 2021 | Accepted 20 August 2021 | Published 10 September 2021

Citation: Tong Y-H, Zhao W-L, Wang B-M, Liu E-D, Cai J, Guo Y-J (2021) *Vaccinium motuoense* (Ericaceae), a new species from Xizang, China. PhytoKeys 181: 105–111. https://doi.org/10.3897/phytokeys.181.71522

Abstract

Vaccinium motuoense (Ericaceae), a new species from Motuo County, Xizang Autonomous Region, China is described and illustrated. This new species belongs to *Vaccinium* sect. *Calcicolus* and is morphologically most similar to *V. dunalianum*, but differs in having yellowish-brown tomentose young branches, petioles and inflorescence rachis, leaf blades with 2–3(–4) pairs of secondary veins, usually all basal and with fine veins impressed adaxially and urceolate to spherical corollas.

Keywords

Morphology, new species, *Vaccinium dunalianum*

Introduction

The genus *Vaccinium* L. (Ericaceae), with about 450–500 species distributed worldwide, is the largest genus of the blueberry tribe or Vaccinieae Rchb. (Fang 1991; Fang and Stevens 2005; Vander Kloet and Dickinson 2009). In China, 95 species of

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Vaccinium are recorded, including the recently published *V. damingshanense* Y. H. Tong & N. H. Xia and *V. napoense* Y. H. Tong & N. H. Xia from Guangxi and *V. zhangzhouense* Y. H. Tong et al. from Fujian (Tong and Xia 2015; Tong et al. 2020, 2021). There are 15 species of *Vaccinium* recorded from Xizang Autonomous Region, most of which occur in the south to south-eastern part of that Province (Fang 1986).

During work on a revision of *Vaccinium* species from China, we observed that several specimens, identified as *V. dunalianum* var. *urophyllum* Rehder & E. H. Wilson from Motuo County, southeast Xizang, differ substantially from those from other places in China in the leaf blade with relatively long caudate apex and the yellowish-brown tomentose inflorescence rachis. Thus, we conducted two field trips to collect fresh flowering and fruiting material for further study. We found that, in addition to the difference in the indumentum on the inflorescence rachis noted by Fang (1991: 95), the population of *V. dunalianum* var. *urophyllum* from Motuo County could be further distinguished from other populations of that variety and, even, the entire species *V. dunalianum* Wight by the shape and venation of the leaf blade and the shape of the corolla. Thus, we concluded that the population of *V. dunalianum* var. *urophyllum* from Motuo represents a new species, described below.

Materials and methods

Fruiting and flowering material was collected from Motuo County, Xizang Autonomous Region, China during two field trips in January 2020 and May 2021. Descriptions were based on both living and dried collections, which were deposited at the Herbaria of the Institute of Botany, Chinese Academy of Sciences (**PE**), Kunming Institute of Botany, Chinese Academy of Sciences (**KUN**) and South China Botanical Garden, Chinese Academy of Sciences (**IBSC**). Measurements were performed with a ruler and small plant parts were observed and measured under a stereomicroscope (Mshot-MZ101).

Taxonomic treatment

Vaccinium motuoense **Y.H. Tong & Y.J. Guo, sp. nov.**
urn:lsid:ipni.org:names:77219644-1
Figures 1, 2

Type. China. Xizang Autonomous Region: Motuo County, Km 80 on Zhamo Road, epiphytic on trees in evergreen broad-leaved forest, 29°40'59.9"N, 95°30'6.3"E, 2191 m a.s.l., 28 May 2021 (fl.), *Z. Liu & W. L. Zhao TYH-2523* (holotype: IBSC, isotypes: IBSC, KUN).

Diagnosis. Similar to *V. dunalianum* Wight, especially *V. dunalianum* var. *urophyllum* Rehder & E. H. Wilson, in the hairy young branches, the shape, size and

Figure 1. *Vaccinium motuoense* sp. nov. **A, B** habit **C** sterile branch with leaves **D** inflorescence **E** fruiting branch **F** fruits, cross section **A, C, E** and **F** taken by Y. H. Tong **B** by W. L. Zhao and **D** by J. Cai.

indumentum of leaf blade and the axillary racemose inflorescence, but distinguished by the yellowish-brown tomentose (vs. glabrous or brownish-white pubescent) young branches, petioles and inflorescence rachis, leaf blades with 2–3(–4) pairs (vs. 4–5) of secondary veins, usually all basal (vs. only lowermost 2–3 pairs basal), with veins impressed adaxially (vs. plane or slightly raised) and flowers with urceolate to spherical corollas (vs. broadly campanulate) (Table 1).

Description. Evergreen shrubs, epiphytic on tree trunks, sprawling or hanging, stem 0.5–3 m long, without swollen basal tuber or root swellings. Young branches brownish, slightly angled, without lenticels, yellowish-brown tomentose, glabrescent and becoming greyish-white when older. Perennating buds dimorphic (floral perennating buds are at least twice the size of vegetative perennating buds). Leaves alter-

Table 1. Morphological comparison of *Vaccinium motuoense* and *V. dunalianum*.

Characters	*V. motuoense* sp. nov.	*V. dunalianum*
Young branches	Yellowish-brown tomentose	Glabrous or brownish-white pubescent
Petiole	Yellowish-brown tomentose	Glabrous or brownish-white pubescent
Leaf blade shape	Ovate or ovate-elliptic	Elliptic, oblong, oblong-lanceolate or ovate
Secondary veins	2–3(–4) pairs, usually all basal, with fine veins impressed adaxially	4–5 pairs, only lowermost 2–3 pairs basal, with fine veins plane or slightly raised adaxially
Inflorescence rachis	Yellowish-brown tomentose	Glabrous
Corolla shape	Urceolate to spherical	Broadly companulate
Filament	Puberulous and pubescent adaxially, slightly puberulous abaxially	Glabrous or puberulous both sides

nate; petiole flattened above, 0.8–1.2 cm long, 1.7–2.2 mm wide, yellowish-brown tomentose throughout, glabrescent; blade ovate or ovate-elliptic, 8.5–13.5 (including caudate apex) × 2.4–5.0 cm, leathery, abaxially with dense appressed black-glandular trichomes, brown-tomentose or -pubescent on veins that are near leaf base both sides, otherwise glabrous, base broadly cuneate to rounded, with one basal gland per side at the junction of leaf base and petiole, margin flat or slightly revolute when dry, entire, apex long caudate 2–4 cm long; veins impressed adaxially, more so when dry, raised abaxially, secondary veins 2–3(–4) per side, usually all basal, short cross-veins (tertiary veins) between the secondaries prominent, nearly transverse and paralleled. Inflorescence racemose, usually axillary on biennial branches, 7–16-flowered. Peduncle usually very short, inflorescence rachis pale green, 0.7–3 cm long, yellowish-brown tomentose, glabrescent when fruiting; bracts pale green, obovate, cucullate, 6–8 × 4–6 mm, abaxially yellowish-brown tomentose or pubescent, adaxially glabrous, margin ciliate, caducous; bracteoles 2, inserted at base of pedicel, pale green, linear, 5–6 × ca. 0.2 mm, ciliate, caducous. Pedicel pale green, 2.5–4.5 mm long, yellowish-brown tomentose or pubescent or nearly glabrous, articulate with the hypanthium. Hypanthium green, cupuliform, 1.5–2.0 × 1.2–1.5 mm, glabrous; calyx limb lobed nearly to base, lobes 5, green, triangular, ca. 1.5 × 1 mm, apex acuminate, margin ciliate, with denser and longer cilia at apex. Corolla white or virescent, sometimes tinged with red on angles when young, urceolate to spherical, slightly angled when young, 4.5–6 × ca. 4.5 mm, glabrous outside, pubescent inside, 5-lobed; lobes ovate-triangular, reflexed, ca. 1 × 1.2 mm. Stamens 10, 4–4.5 mm long; filaments flat, slightly S-shaped, 1.5–2.0 mm long, puberulous and pubescent adaxially, slightly puberulous abaxially; anthers 3.0–3.5 mm long, thecae 1.5–1.7 mm long, tubules narrower than the thecae, 1.5–1.8 mm long, each with an oblique pore 0.7–1.0 mm long, 0.2–0.3 mm in diam.; spurs 2, borne at abaxial base of tubules, 0.8–1 mm long, echinate. Disc yellowish, annular, glabrous; style cylindrical, slightly angled in sicco, 5.0–5.2 mm long, glabrous, stigma punctate; ovary pseudo-10-locular, each locule with 8–10 ovules. Fruiting pedicel 4–11 mm long, expanded at apex; berry green when young, turning dark red later and finally dark purple at maturity, globose, 4–6.5 mm in diam., glabrous, with persistent calyx lobes appressed at apex. Seeds ovoid, 1.2–1.5 × 0.8–1 mm, testa brownish, reticulate, soft.

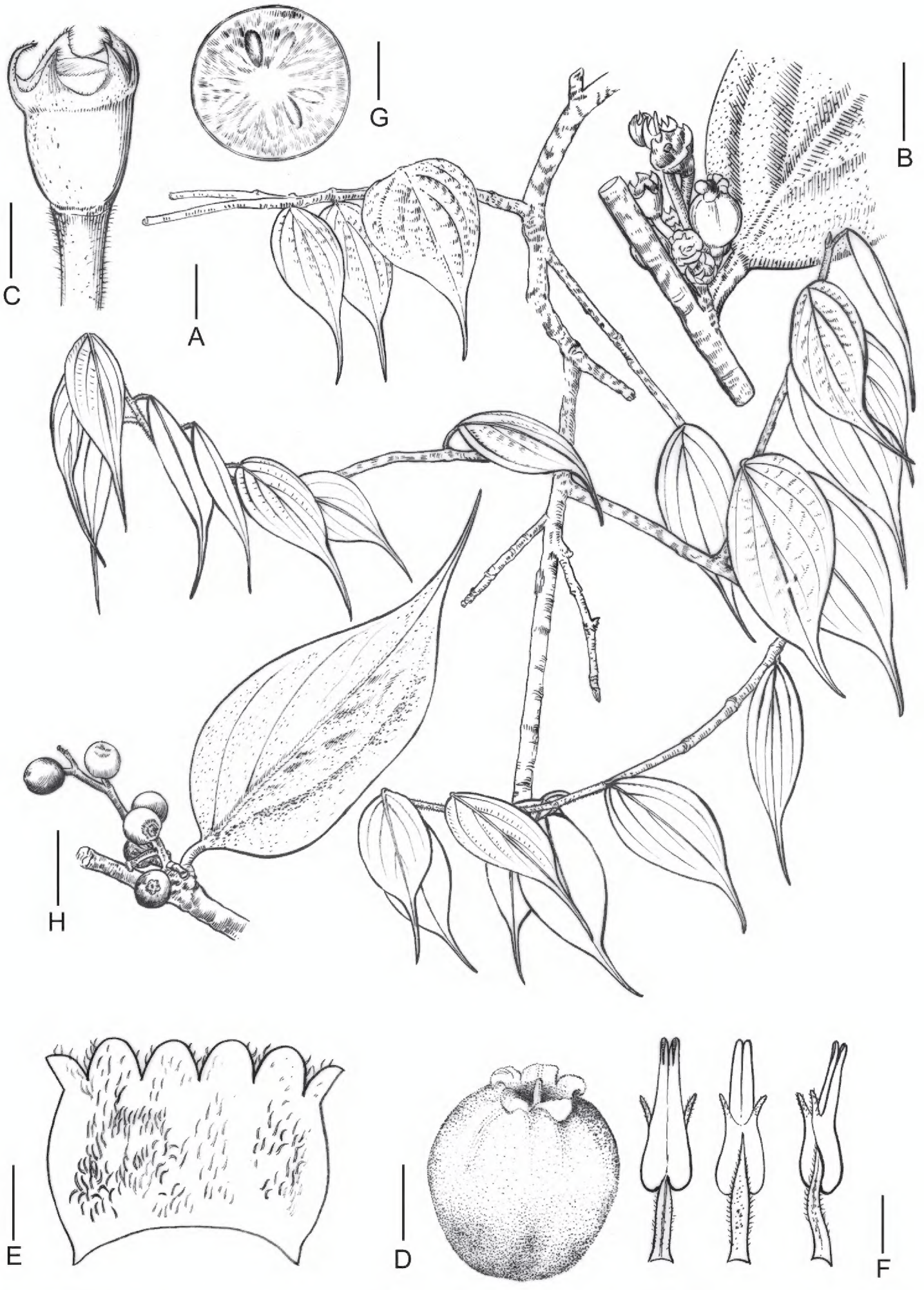

Figure 2. *Vaccinium motuoense* sp. nov. **A** sterile branches with leaves **B** inflorescence **C** calyx **D** corolla **E** opened corolla, showing pubescent internal surface **F** stamens, adaxial, abaxial and lateral view **G** transection of fruit **H** infructescence (Drawn by Ding-Han Cui). Scale bars: 2 cm (**A, B, H**); 5 mm (**C, G**); 2 mm (**D, E**); 1 mm (**F**).

Etymology. The species epithet is named after the type locality, Motuo County.

Vernacular name. 墨脱越橘 (Chinese pinyin: mò tuō yuè jú).

Distribution and habitat. This species is currently known only from Motuo County, Xizang, China. It grows on trees in evergreen broad-leaved forests at elevations of 1600–2300 m.

Conservation status. *Vaccinium motuoense* is common in the forests of Motuo County within an area over 3000 km^2 and the whole area is under the protection of Yarlung Zangbo Grand Canyon National Nature Reserve. The threat risk seems to be low because it is not economically valuable and the conservation condition of the Reserve is good. Thus, it is assigned a status of 'Least Concern' (LC), following the IUCN Red List Categories and Criteria (IUCN Standards and Petitions Committee 2019).

Phenology. Flowering in April-May and fruiting in October-March.

Additional specimens examined (paratypes). China. Xizang, Autonomous Region, Motuo County: 3.5 km away from Bolonggong to Km 52 on Zhamo Road, 31 May 2013 (fl.), *J. Cai, E. D. Liu & Y. J. Guo 13CS7683* (KUN); Km 80 on Zhamo Road, 5 January 2020 (fr.), *Y. H. Tong & B. M. Wang TYH-2381* (IBSC); ibid. 12 January 1983 (fr.), *B. S. Li & S. Z. Cheng 02486* (KUN); Beibeng Xiang, Buqiong Hu, 11 November 1992 (fr.), *H. Sun, Z. K. Zhou & H. Y. Yu ETM-1145* (KUN); Beibeng Xiang, Gelin Cun, 20 May 1983 (fl.), *B. S. Li, Z. C. Ni & S. Z. Cheng 03651* (KUN), 3 January 2020 (fr.); ibid. *Y. H. Tong & B. M. Wang TYH-2338* (IBSC); Beibeng Xiang, Xirang, Sangxingpeng, 26 April 1983 (fl.), *B. S. Li, Z. C. Ni & S. Z. Cheng 04317* (KUN); Beibeng Xiang, Xirang, Xideng Shan, 25 April 1983 (fl.), *B. S. Li, Z. C. Ni & S. Z. Cheng 04752* (KUN); ibid. 12 January 1983 (fr.), *B. S. Li, Z. C. Ni & S. Z. Cheng 02486* (KUN); Damu Xiang, 6 March 1993 (fr.), *H. Sun, Z. K. Zhou & H. Y. Yu ETM-4243* (KUN); Damu Xiang, Dachi Shan, 30 October 1982 (fr.), *B. S. Li & S. Z. Cheng 01600* (KUN, PE); Damu Xiang to Gedang Xiang, 13 March 1993 (fr.), *H. Sun, Z. K. Zhou & H. Y. Yu ETM-4562* (KUN); Gedang Xiang, 21 March 1993 (fr.), *H. Sun, Z. K. Zhou & H. Y. Yu ETM-4920* (KUN); without precise locality, without date, *H. Sun, Z. K. Zhou & H. Y. Yu ETM-2621* (KUN).

Discussion

According to Vander Kloet and Dickinson's infrageneric classification of *Vaccinium*, *V. medongense* fits well with the circumscription of *V.* sect. *Calcicolus* Kloet that is characterised by an evergreen habit, dimorphic perennating buds (i.e. floral perennating buds at least twice the size of vegetative perennating buds), racemose inflorescences with large caducous bracts, pseudo-10-locular ovary, berry with 2–5 seeds per locule and soft seed testa (Vander Kloet and Dickinson 2005, 2009). In Xizang, besides *V. dunalianum*, there are two other species from the same section, viz. *V. gaultheriifolium* (Griff.) Hook. f. ex C. B. Clarke and *V. glaucoalbum* Hook. f. ex C. B. Clarke. However, these two species have glabrous and glaucous abaxial surface of leaf blades with serrate margins and acute or acuminate apices and, thus, are easily distinguishable from *V. motuoense*. This new species is common in its area of distribution, usually

growing together with other epiphytic plants on tree trunks covered with mosses, such as orchids, ferns and some other ericaceous species like *Agapetes praeclara* C. Marquand, *A. forrestii* W. E. Evans, *Vaccinium leucobotrys* (Nutt.) G. Nicholson, *V. retusum* Hook. f. ex C. B. Clarke and *V. kingdon-wardii* Sleumer.

Acknowledgements

We are grateful to Zhen Liu from Motuo Forestry Bureau and Xi-Xian Wang from China Railway 12th Bureau Group for their help during field trips. Our thanks also go to the curators of IBSC, KUN and PE for allowing us to examine their specimens and to Mr. Ding-Han Cui for preparing the line drawing. This study was funded by the National Natural Science Foundation of China (grant no. 31870180), Biological Resources Program, Chinese Academy of Sciences (KFJ-BRP-017-33) and the programme of Germplasm Bank of Wild Species, National Science & Technology Infrastructure and the Large-scale Scientific Facilities of the Chinese Academy of Sciences (2017-LSFGBOWS-02).

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